

We Claim:

1. A composition comprising a CD20 binding molecule, wherein said CD20 binding molecule has a binding affinity (K_d) for human CD20 of 5.0×10^{-10} M or less, and a dissociation rate (k_{off}) for human CD20 of $5.0 \times 10^{-4} \text{ s}^{-1}$ or less.

2. The composition of Claim 1, wherein said CD20 binding molecule has a binding affinity (K_d) for human CD20 of 1.5×10^{-10} M or less.

3. The composition of Claim 1, wherein said CD20 binding molecule has a dissociation rate (k_{off}) for human CD20 of $2.5 \times 10^{-4} \text{ s}^{-1}$ or less.

4. The composition of Claim 1, wherein said CD20 binding molecule has an association rate (k_{on}) for human CD20 of $5.0 \times 10^5 \text{ M}^{-1} \text{ s}^{-1}$ or greater.

5. The composition of Claim 1, wherein said CD20 binding molecule comprises a light chain variable region and a heavy chain variable region.

6. The composition of Claim 5, wherein said light chain variable region comprises a fully human framework.

7. The composition of Claim 5, wherein said light chain variable region comprises a human germline framework.

8. The composition of Claim 5, wherein said heavy chain variable region comprises a fully human framework.

9. The composition of Claim 5, wherein said heavy chain variable region comprises a human germline framework.

10. The composition of Claim 1, wherein said CD20 binding molecule comprises an antibody or antibody fragment.

11. A composition comprising a CD20 binding molecule, wherein said CD20 binding molecule comprises:

a) a light chain variable region, wherein said light chain variable region comprises;

i) a CDRL1 amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, and SEQ ID NO:5;

ii) a CDRL2 amino acid sequence selected from the group consisting of SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:11, and SEQ ID NO:13; and

iii) a CDRL3 amino acid sequence selected from the group consisting of SEQ ID NO:17, SEQ ID NO:19, and SEQ ID NO:21; and

b) a heavy chain variable region, wherein said heavy chain variable region comprises;

i) a CDRH1 amino acid sequence selected from the group consisting of SEQ ID NO:23 and SEQ ID NO:25;

ii) a CDRH2 amino acid sequence selected from the group consisting of SEQ ID NO:27, SEQ ID NO:29, SEQ ID NO:31, SEQ ID NO:33, SEQ ID NO:35, SEQ ID NO:37, and SEQ ID NO:39; and

iii) a CDRH3 amino acid sequence selected from the group consisting of SEQ ID NO:43, SEQ ID NO:45, SEQ ID NO:47, SEQ ID NO:49, SEQ ID NO:51, SEQ ID NO:53, SEQ ID NO:55, and SEQ ID NO:57.

12. The composition of Claim 11, wherein said light chain variable region comprises a fully human framework.

13. The composition of Claim 11, wherein said light chain variable region comprise a human germline framework.

14. The composition of Claim 11, wherein said heavy chain variable region comprises a fully human framework.

15. The composition of Claim 11, wherein said heavy chain variable region comprises a human germline framework.

16. The composition of Claim 11, wherein said CD20 binding molecule comprises an antibody or antibody fragment.

5 17. The composition of Claim 11, wherein said CD20 binding molecule comprises the AME 33 Fab.

18. A composition comprising:

a) a first nucleic acid sequence encoding a light chain variable region,
10 wherein said light chain variable region comprises;

i) a CDRL1 amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, and SEQ ID NO:5;

ii) a CDRL2 amino acid sequence selected from the group consisting of SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:11, and SEQ ID
15 NO:13; and

iii) a CDRL3 amino acid sequence selected from the group consisting of SEQ ID NO:17, SEQ ID NO:19, and SEQ ID NO:21; and

b) a second nucleic acid sequence encoding a heavy chain variable region, wherein said heavy chain variable region comprises;

20 i) a CDRH1 amino acid sequence selected from the group consisting of SEQ ID NO:23 and SEQ ID NO:25;

ii) a CDRH2 amino acid sequence selected from the group consisting of SEQ ID NO:27, SEQ ID NO:29, SEQ ID NO:31, SEQ ID NO:33, SEQ ID NO:35, SEQ ID NO:37, and SEQ ID NO:39; and

25 iii) a CDRH3 amino acid sequence selected from the group consisting of SEQ ID NO:43, SEQ ID NO:45, SEQ ID NO:47, SEQ ID NO:49, SEQ ID NO:51, SEQ ID NO:53, SEQ ID NO:55, and SEQ ID NO:57.

30 19. The composition of Claim 18, wherein said light chain variable region comprises a fully human framework.

20. The composition of Claim 18, wherein said light chain variable region comprise a human germline framework.

21. The composition of Claim 18, wherein said heavy chain variable region comprises a fully human framework.

22. The composition of Claim 18, wherein said heavy chain variable region
5 comprises a human germline framework.

23. The composition of Claim 18, wherein said CD20 binding molecule comprises an antibody or antibody fragment.

10 24. The composition of Claim 18, wherein said CD20 binding molecule comprises the AME 33 Fab.

25. A method of treating B cell lymphoma comprising:

a) providing;

15 i) a subject, and

ii) a composition, wherein said composition comprises CD20 binding molecules that have a binding affinity (K_d) for human CD20 of 5.0×10^{-10} M or less, and a dissociation rate (k_{off}) for human CD20 of $5.0 \times 10^{-4} \text{ s}^{-1}$ or less; and

20 b) administering said composition to said subject.

26. The composition of Claim 25, wherein said CD20 binding molecule comprises a light chain variable region and a heavy chain variable region.

25 27. The composition of Claim 26, wherein said light chain variable region comprises a fully human framework.

28. The composition of Claim 26, wherein said light chain variable region comprise a human germline framework.

30 29. The composition of Claim 26, wherein said heavy chain variable region comprises a fully human framework.

30. The composition of Claim 26, wherein said heavy chain variable region comprises a human germline framework.

5 31. The composition of Claim 25, wherein said CD20 binding molecule comprises an antibody or antibody fragment.

32. The composition of Claim 25, wherein said CD20 binding molecule comprises the AME 33 Fab.

10 33. Use of CD20 binding molecules that have a binding affinity (K_d) for human CD20 of 5.0×10^{-10} M or less, and a dissociation rate (k_{off}) for human CD20 of $5.0 \times 10^{-4} s^{-1}$ or less, for the preparation of a composition for the treatment of B cell lymphoma.

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